Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended)   A polymer nanoparticle comprising:
   a. an inner layer including alkenylbenzene monomer units,

   b. an outer layer including monomer units selected from the group consisting of conjugated diene, alkylene, alkenylbenzenes, and mixtures thereof,

   c. at least one functional group associated with said outer layer, and

   d. at least one metal complexed with said functional group;

   wherein said functional group is selected from the group consisting of maleimide, hydroxyl, carboxyl formyl, azocarboxy, epoxide, amino and mixtures thereof; or wherein said functional group is provided by a dicarboxylic anhydride.

2. (Currently Amended)   The polymer nanoparticle of claim 1 ~~wherein said nanoparticle,~~ a plurality of which is substantially monodisperse.

3. (Currently Amended)   The polymer nanoparticle of claim 1 ~~futher~~ further including a core comprised of conjugated diene and vinylstyrene monomer units.

4. (Previously Presented) The polymer nanoparticle of claim 1 wherein said alkenylbenzene monomer units are selected from the group consisting of styrene, α-methyl styrene, 1-vinyl naphthalene, 2-vinyl naphthalene, 1-α-methyl vinyl naphthalene, 2-α-methyl vinyl naphthalene, vinyl toluene, methoxystyrene, 6-butoxystyrene, and cycloalkyl, aryl, alkaryl, and aralkyl derivatives thereof, in which the total number of

carbon atoms in the combined hydrocarbon is not greater than 18, and any di-or tri-substituted aromatic hydrocarbons, and mixtures thereof.

5. (Previously Presented) The polymer nanoparticle of claim 1 wherein said alkylene monomer units are formed by hydrogenating said conjugated diene monomer units.

6. (Previously Presented) The polymer nanoparticle of claim 1 wherein said functional group is polar.

7. (Currently Cancelled) ~~The polymer nanoparticle of claim 1 wherein said functional group is selected from the group consisting of maleimide, hydroxyl, carboxy, formyl, azocarboxy, epoxide, amino, and mixtures thereof.~~

8. (Previously Presented) The polymer nanoparticle of claim 1 wherein said metal is selected from the group consisting of Cu, Ti, Fe, Cd, Ni, Pd, and mixtures thereof.

9. (Previously Presented) The polymer nanoparticle of claim 1 wherein said nanoparticle is crosslinked.

10. (Previously Presented) The polymer nanoparticle of claim 1 wherein said nanoparticle has a mean average diameter of less than about 100 nm.

11. (Previously Presented) A process for forming polymer nanoparticles comprising:

      a. polymerizing alkenylbenzene monomer and conjugated diene monomer in a hydrocarbon solvent to form a diblock polymer;

      b. forming micelles of said diblock polymer;

      c. adding at least one cross-linking agent to the micelles to form crosslinked nanoparticles, said nanoparticles having an inner layer including alkenylbenzene monomer units and a outer layer including monomer units selected from the group consisting of alkenylbenzenes, conjugated dienes, and mixtures thereof,

      d. reacting said nanoparticles with at least one functional group to form functionalized nanoparticles, and

      e. exposing said functionalized nanoparticles with a metal to cause metal nanocomposites to associate with said functional group.

12. (Currently Amended) The process of claim 11 wherein said step a is performed in the presence of a lithium initiator.

13. (Original) The process of claim 11 wherein an alkane solvent charge is made between steps b and c or during step c.

14. (Previously Presented) The process of claim 11 further including a hydrogenation step after step b, c, or d.

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15. (Original)   The process of claim 11 wherein said conjugated diene monomer units are selected from the group consisting of C_4-C_8 conjugated dienes and mixtures thereof.

16. (Previously Presented) The process of claim 11 wherein said alkenylbenzene monomer units of the inner layer and outer layer are independently selected from the group consisting of styrene, α-methyl styrene, 1-vinyl naphthalene, 2-vinyl naphthalene, 1-α-methyl vinyl naphthalene, 2-α-methyl vinyl naphthalene, vinyl toluene, methoxystyrene, ß-butoxystyrene, and cycloalkyl, aryl, alkaryl, and aralkyl derivatives thereof, in which the total number of carbon atoms in the combined hydrocarbon is not greater than 18, and any di-or tri-substituted aromatic hydrocarbons, and mixtures thereof.

17. (Original)   The process of claim 11 wherein said functional group is selected from the maleimide, hydroxyl, carboxy, formyl, azocarboxy, epoxide, amino, and mixtures thereof.

18. (Original)   The process of claim 17 wherein said functional group is provided by a dicarboxylic anhydride selected from the group consisting of anhydride, acetic anhydride, succinic anhydride, phthalic anhydride, oxalic anhydride, malonic anhydride, glutaric anhydride, dimethyl malonic anhydride, adipic anhydride, pimelic anhydride, α,α-dimethyl succinic anhydride, sebacic anhydride, fumaric anhydride, itaconic anhydride, citraconic anhydride, isophthalic anhydride, telephthalic anhydride,

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tetrachloroterephthalic anhydride, and mixtures thereof, hydroxyl, carboxy, formyl, azocarboxy, epoxide, amino, and mixtures thereof.

19. (Original)   The process of claim 11 wherein said metal is selected from the group consisting of Cu, Ti, Fe, Cd, Ni, Pd, and mixtures thereof.

20. (Original)   The process of claim 11 wherein step d is performed before step c.

21. (Original)   The process of claim 11 further comprising releasing said metal nanocomposites from said functionalized nanoparticle by performing a solvent change.

22. (Original)   The process of claim 11 wherein said metal nanocomposite has a mean average diameter between about 0.1 and 50 nm.

23. (Currently Amended)   A metal nanocomposite formed by the steps comprising:

      a. polymerizing alkenylbenzene and conjugated diene monomer in a hydrocarbon solvent to form a diblock polymer;

      b. forming a mixture including micelles of said diblock polymer;

      c. adding at least one cross-linking agent to the mixture to form a crosslinked nanoparticle from said micelles, said nanoparticle having an inner layer including monomer units selected from the group

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consisting of alkenylbenzenes, conjugated dienes, and mixtures thereof,

d. reacting said nanoparticle with at least one monomer having a functional group to form a functionalized nanoparticle,

e. contacting said functionalized nanoparticle with a metal such that said metal complexes with said functional group to form a metal nanocomposite, and

f. releasing said metal nanocomposite from said functionalized nanoparticle by performing a solvent charge;

wherein said functional group is selected from the group consisting of maleimide, hydroxyl, carboxyl formyl, azocarboxy, epoxide, amino and mixtures thereof; or wherein said functional group is provided by a dicarboxylic anhydride.

24. (Original) The metal nanocomposite of claim 22 wherein said metal nanocomposite includes at least one metal selected from the group consisting of Cu, Ti, Fe, Cd, Ni, Pd, and mixtures thereof.

25. (Newly Added) The polymer nanoparticle of claim 1 wherein said dicarboxylic anhydride is selected from the group consisting of anhydride, acetic anhydride, succinic anhydride, phthalic anhydride, oxalic anhydride, malonic anhydride, glutaric anhydride, dimethyl malonic anhydride, adipic anhydride, pimelic anhydride, α,α-dimethyl succinic anhydride, sebacic anhydride, fumaric anhydride, itaconic anhydride, citraconic anhydride, isophthalic anhydride, telephthalic anhydride, tetrachloroterephthalic anhydride, and mixtures thereof.

26. (Newly Added) A polymer nanoparticle comprising:

a. an inner layer including alkenylbenzene monomer units,

b. an outer layer including monomer units selected from the group consisting of conjugated diene, alkylene, alkenylbenzenes, and mixtures thereof,

c. at least one polar functional group associated with said outer layer, and

d. at least one metal complexed with said functional group.

27. (Newly Added) A polymer nanoparticle comprising:

a. an inner layer including alkenylbenzene monomer units,

b. an outer layer including monomer units selected from the group consisting of conjugated diene, alkylene, alkenylbenzenes, and mixtures thereof,

c. at least one functional group associated with said outer layer, and

d. at least one metal selected from Cu, Ti, Fe, Cd, Ni, Pd and mixtures thereof, complexed with said functional group.